

MULTIPLE-ANTENNA COMMUNICATION SYSTEMS AND METHODS  
FOR COMMUNICATING IN WIRELESS LOCAL AREA NETWORKS  
THAT INCLUDE SINGLE-ANTENNA COMMUNICATION DEVICES

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Abstract of the Disclosure

10 In a wireless local area network (WLAN) that includes high-throughput  
communication devices with multiple antennas and legacy communication  
devices with single antennas, training tones are transmitted over a plurality of  
spatial channels during a first portion of an orthogonal frequency division  
multiplexed (OFDM) packet-training preamble. The training tones are  
interspersed among subcarrier frequencies of the spatial channels. The training  
tones are retransmitted during a second portion of the packet-training preamble.  
The training tones are shifted among the subcarrier frequencies of the spatial  
15 channels during the retransmission allowing a high-throughput receiving station  
to perform a channel estimation on different subcarrier frequencies of the spatial  
channels. The legacy communication devices may receive and process the  
training tones and may set their network allocation vector to refrain from  
communicating during a subsequent interval.

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